QNAP Turbo NAS

TVS-871T Hardware User Manual

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Thank you for choosing QNAP products! This user manual provides description of the hardware of the Turbo NAS and relevant guideline of certain functions. Please read carefully and strictly adhere to the instructions of the manual.

This user manual is applicable to the following Turbo NAS models:
TVS-871T-i5-16G, TVS-871T-i7-16G

NOTE

- The "Turbo NAS" is hereafter referred to as "NAS".
- The product you purchased may not support certain functions dedicated to specific models.
- All features, functionality, and other product specifications are subject to change without prior notice or obligation.
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Note:

1. Back up your system periodically to avoid any potential data loss. QNAP disclaims any responsibility of all sorts of data loss or recovery.
2. Should you return any components of the NAS package for refund or maintenance, make sure they are carefully packed for shipping. Any form of damages due to improper packaging will not be compensated.

Regulatory Notice

FCC Notice

The QNAP NAS complies with different FCC compliance classes. Please refer to Chapter 9 for details. Once the class of the device is determined, refer to the following corresponding statement.

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FCC Class A Notice

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

Modifications: Any modifications made to this device that are not approved by QNAP Systems, Inc. may void the authority granted to the user by the FCC to operate this equipment.

FCC Class B Notice

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/television technician for help.

Modifications: Any modifications made to this device that are not approved by QNAP Systems, Inc. may void the authority granted to the user by the FCC to operate this equipment.

CE NOTICE

The QNAP NAS complies with different CE compliance classes. Please refer to Chapter 9 for details.

Symbols in this document

Warning	This icon indicates the instructions must be strictly followed. Failure to do so could result in injury to human body or death.
Caution	This icon indicates the action may lead to disk clearance or loss OR failure to follow the instructions could result in data damage, disk damage, or product damage.

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Safety Warnings

1. The NAS can operate normally in the temperature of 0ºC–40ºC (32ºF -104ºF) and relative humidity of 5%–95%. Please make sure the environment is well-ventilated.
2. The power cord and devices connected to the NAS must provide correct supply voltage (100W, 90–264V).
3. Do not place the NAS in direct sunlight or near chemicals. Make sure the temperature and humidity of the environment are in optimized level.
4. Unplug the power cord and all connected cables before cleaning. Wipe the NAS with a dry towel. Do not use chemical or aerosol to clean the NAS.
5. Do not place any objects on the NAS for the server's normal operation and to avoid overheat.
6. Use the flat head screws in the product package to lock the hard disks in the NAS when installing hard disks for proper operation.
7. Do not place the NAS near any liquid.
8. Do not place the NAS on any uneven surface to avoid falling off and damage.
9. Make sure the voltage is correct in the location where the NAS is installed. Contact the distributor or the local power supply company for the information.
10. Do not place any object on the power cord.
11. Do not attempt to repair the NAS in any occasions. Improper disassembly of the product may expose the users to electric shock or other risks. For any enquiries, please contact the distributor.
12. The chassis NAS models should only be installed in the server room and maintained by the authorized server manager or IT administrator. The server room is locked by key or keycard access and only certified staff is allowed to enter the server room.

Warning:

- Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.
- Do NOT touch the fan inside the system to avoid serious injuries.

Chapter 1. CPU and Memory Specifications

Caution: Modifying the hardware, software, or firmware of the QNAP products will void the warranty. QNAP is not responsible for any form of damage or loss of data caused by modding the QNAP products. Users should bear their own risks of all sorts of possible data loss or system instabilities due to changing the hardware parts, modifying the default system firmware or installing any unauthorized third party applications on QNAP products.

System	**TVS-871T-i5**	**TVS-871T-i7**
CPU	Intel 4th Generation Core i5 quad core processor	Intel 4th Generation Core i7 quad core processor
Memory	16GB DDR3 RAM	16GB DDR3 RAM
Flash	512MB (USB DOM)	512MB (USB DOM)
CPU replaceable?	No	No
Memory replaceable?	No	No
Number of SO-DIMM slots	2	2
Number of hard drive slots	8	8
Number of PCIe slots	2 (occupied by thunderbolt HBA and 10GbE adapter)	2 (occupied by thunderbolt HBA and 10GbE adapter)
Number of Thunderbolt ports	2	2
Number of Gigabit network ports	4	4
Number of 10 Gigabit network ports	2	2

Chapter 2. Power Button and Reset Button Behavior

✓ Power button: Press to turn on or turn off.

System	Power button (Turn on)	Power button (Hardware turn off)	Power button (Force turn off)
All models	Press once	1.5 sec	5 sec

✓ Reset button: Press to reset the system settings.

System	Basic system reset (1 beep)	Advanced system reset (2 beeps)
All models	3 sec	10 sec

Basic system reset (3 sec)

Press the reset button for 3 seconds, a beep sound will be heard. The following settings are reset to default:

- System administration password: admin
- TCP/IP configuration: Obtain the IP address settings automatically via DHCP
- TCP/IP configuration: Disable Jumbo Frame
- TCP/IP configuration: If port trunking is enabled (dual LAN models only), the port trunking mode will be reset to "Active Backup (Failover)".
- System Port: 8080 (system service port)
- Security Level: Low (Allow all connections)
- LCD panel password: (blank)*
- VLAN will be disabled.
- Service binding: All the NAS services run on all available network interfaces.

*This feature is only provided by the NAS models with LCD panels. Please visit http://www.qnap.com for details.

Advanced system reset (10 sec)

Press the reset button for 10 seconds; you will hear two beeps at the third and the tenth seconds. The NAS will reset all the system settings to default as it does by web-based system reset in "Control Panel" > "System Settings" > "Backup / Restore" > "Restore to Factory Default" except all the data are reserved. The settings such as the users, user groups, and the network share folders previously created will be cleared. To retrieve the old data after the advanced system reset, create the same network share folders on the NAS and the data will be accessible again.

Chapter 3. USB One Touch Copy

This feature is only provided by NAS models with a USB One Touch Copy button. Please visit http://www.qnap.com for more details.

System	Number of seconds (press the one touch copy button to trigger data copy)
All NAS models	0.5 sec

Data Copy by the Front USB Port

The NAS supports instant data backup from a USB device to the NAS or the other way round by using the front one touch copy button. To use this function, follow these steps:

1. Make sure at least one hard drive is installed and formatted on the NAS. The default network share Qusb or Usb will be created.
2. Turn on the NAS.
3. Configure the behavior of the Copy button in "Backup Station" > "External Backup" > "USB one touch copy".
4. Connect the USB storage device to the front USB port of the NAS.
5. Press the Copy button. The USB LED will flash and the data will be copied to or from the USB device according to the NAS settings.

Note: This feature adopts incremental backup. After the first time backing up data, the NAS will only copy files that have changed since the last backup.

Chapter 4. LED and Alarm Buzzer Specifications

The LED indicators of the NAS indicate the system status and information. When the NAS is turned on, check the following items to make sure the system status is normal. Note that the following LED information is applicable only when users have properly installed the hard drive, and connected the NAS to the network and the power supply.

LED	Color	LED Status	Description
System Status	Red/ Green	Flashes green and red alternately every 0.5 sec	1. The hard drive on the NAS is being formatted. 2. The NAS is being initialized. 3. The system firmware is being updated. 4. RAID rebuilding is in process. 5. Online RAID capacity expansion is in process. 6. Online RAID level migration is in process.
		Red	1. The hard drive is invalid. 2. The disk volume has reached its full capacity. 3. The disk volume is going to be full. 4. The system fan is out of function. 5. An error occurs when accessing (read/write) the disk data. 6. A bad sector is detected on the hard drive. 7. The NAS is in degraded read-only mode (2 member drives fail in a RAID 5 or RAID 6 configuration, the disk data can still be read). 8. Hardware self-test error.
		Flashes red every 0.5 sec	The NAS is in degraded mode (one member drive fails in RAID 1, RAID 5 or RAID 6 configuration).
		Flashes green every 0.5 sec	1. The NAS is starting up. 2. The NAS is not configured. 3. A hard disk drive is not formatted.
		Green	The NAS is ready.
		Off	All the hard drives on the NAS are in standby mode.

LAN	Orange	Orange	The disk data is being accessed from the network and a read/write error occurs during the process.
		Flashes orange	The NAS is connected to the network.
USB**	Blue	Flashes blue every 0.5 sec	1. A USB device (connected to the front USB port) is being detected. 2. A USB device (connected to the front USB port) is being removed from the NAS. 3. The USB device (connected to the front USB port of the NAS) is being accessed. 4. The data is being copied to or from the external USB or eSATA device.
		Blue	A front USB device is detected (after the device is mounted).
		Off	1. No USB device is detected. 2. The NAS has finished copying the data to or from the USB device connected to the front USB port.
HDD	Red/ Green	Flashes red	The NAS is being accessed from the network.
		Red	A hard drive read/write error occurs.
		Flashes green	The disk data is being accessed.
		Green	The hard drive can be accessed.

Chapter 5. Beep alarm: All NAS models

The beep alarm can be disabled in "Control Panel" > "System Settings" > "Hardware".

Beep sound	Number of Times	Description
Short beep (0.5 sec)	1	1. The NAS is starting up. 2. The NAS is being shut down (software shutdown). 3. The user presses the reset button to reset the NAS. 4. The system firmware has been updated.
Short beep (0.5 sec)	3	The NAS data cannot be copied to the external storage device from the front USB port.
Long beep (1.5 sec)	3, every 5 min	The system fan is out of function.
Long beep (1.5 sec)	2	1. The disk volume is going to be full. 2. The disk volume has reached its full capacity. 3. The hard drives on the NAS are in degraded mode. 4. The user starts the hard drive rebuilding process. 5. A hard drive is plugged in or out.
	1	1. The NAS is turned off by force shutdown (hardware shutdown). 2. The NAS has been turned on and is ready.

Chapter 6. Hot-swap Hard Drives

The QNAP NAS is compatible with 2.5-inch/3.5-inch SATA hard drives from major hard drive brands. For the updated hard drive compatibility list, please visit http://www.qnap.com.

Caution:

- QNAP disclaims any responsibility for product damage/malfunction or data loss/recovery due to misuse or improper installation of hard disks in any occasions for any reasons.
- Note that if a hard drive (new or used) which has never been installed on the NAS before is installed, the hard drive will be formatted and partitioned automatically and all the disk data will be cleared.

System	Supports 3.5-inch SATA Hard Drives	Supports 2.5-inch SATA Hard Drives	Supports SSD	Supports Hot-swapping Hard Drives (RAID 1 or above only)
TVS-871T-i5-16G, TVS-871T-i7-16G	Yes	Yes	Yes	Yes

The NAS supports hot-swapping the hard drives when 1 member drive crashes in RAID 1 or 1–2 member drives crash in RAID 5 or RAID 6. Follow the steps below to hot-swap the hard drive when a member drive fails in a RAID configuration.

1. Login the NAS and check the storage pool status in "Storage Manager" > "Storage Pools".
2. The storage pool status should be "Warning" and RAID group status should be "Degraded".
3. Prepare a new hard drive to replace the failed one. The capacity of the new hard drive should be the same as or larger than the failed hard drive.
4. Unplug the failed drive from the NAS. Wait for about 20 seconds or until the server beeps twice.
5. Remove the failed drive from the drive tray.
6. Install the new hard drive on the drive tray. Insert it to the NAS.
7. The server should beep 1.5 seconds twice.
8. Check the volume status on the web administration page. The volume should be rebuilding.

Warning: Users are strongly recommended to turn OFF the server before replacing the hard drive to reduce the risk of electric shock.

Chapter 7. RAID Recovery

The QNAP NAS supports recovery of a failed RAID group from unintentional disconnection or removal of the hard drives from the system. Users can recover an inactive RAID 1, RAID 5, or RAID 6 group to degraded mode, or an inactive RAID 0 and JBOD configuration to normal.

Disk volume	Supports RAID recovery	Maximum number of disk removal allowed
Single	No	-
JBOD	Yes	1 or more
RAID 0	Yes	1 or more
RAID 1	Yes	1 or 2
RAID 5	Yes	2 or more
RAID 6	Yes	3 or more
RAID 10	No	-

Follow the steps below to recover an inactive RAID group on the NAS:

1. Make sure the volume status of the RAID group is "Not active".
2. Install the same hard drives, which have been formerly removed from the NAS, back to the same hard drive slots.
3. Go to "Storage Manager" > "Storage Pools". Select the degraded or inactive RAID group. Click "Manage" > "Recover".
4. Wait for about 1 minute for the process to complete. When finished, the NAS data can be accessed.

Note:

- After recovering a RAID 1, RAID 5, or RAID 6 RAID group from "not active" to degraded mode by RAID recovery, users can read or write the volume normally. The volume status will be recovered to normal after synchronization.
- If the disconnected drive member is damaged, the RAID recovery function will not work.

	Standard RAID 5	QNAP RAID 5	Standard RAID 6	QNAP RAID 6
Degraded mode	N-1	N-1	N-1 & N-2	N-1 & N-2
Read only protection (for immediate data backup & hard drive replacement)	N/A	N-1, bad blocks found in the surviving drives of the array.	N/A	N-2, bad blocks found in the surviving drives of the array.
RAID recovery (RAID status: Not active)	N/A	If re-inserting all the original hard disk drives to the NAS and they can be spun up, identified, accessed, and the hard drive superblock is not damaged.	N/A	If re-inserting all the original hard disk drives to the NAS and they can be spun up, identified, accessed, and the hard drive superblock is not damaged).
RAID crash	N-2	N-2 failed hard drive and any of the remaining hard drives cannot be spun up or identified or accessed.	N-3	N-3 and any of the remaining hard drives cannot be spun up or identified or accessed.

N = Number of hard disk drives in the array

Chapter 8. Technical Support

QNAP provides dedicated online support and customer service via instant messenger.

Online Support: http://www.qnap.com
Skype: qnapskype
Forum: http://forum.qnap.com

Technical Support in the USA and Canada:
Email: q_supportus@qnap.com
TEL: +1-909-595-2782
Address: 168 University Parkway, Pomona CA 91768
Service Hours: 08:00-17:00 (GMT- 08:00 Pacific Time, Monday to Friday)

Chapter 9. Product Compliance Class

NAS Models	FCC	CE
TVS-871T-i5-16G, TVS-871T-i7-16G	Class B	Class B

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The “source code” for a work means the preferred form of the work for making modifications to it. “Object code” means any non-source form of a work.

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e) Convey the object code using peer-to-peer transmission, provided you inform other peers where the object code and Corresponding Source of the work are being offered to the

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